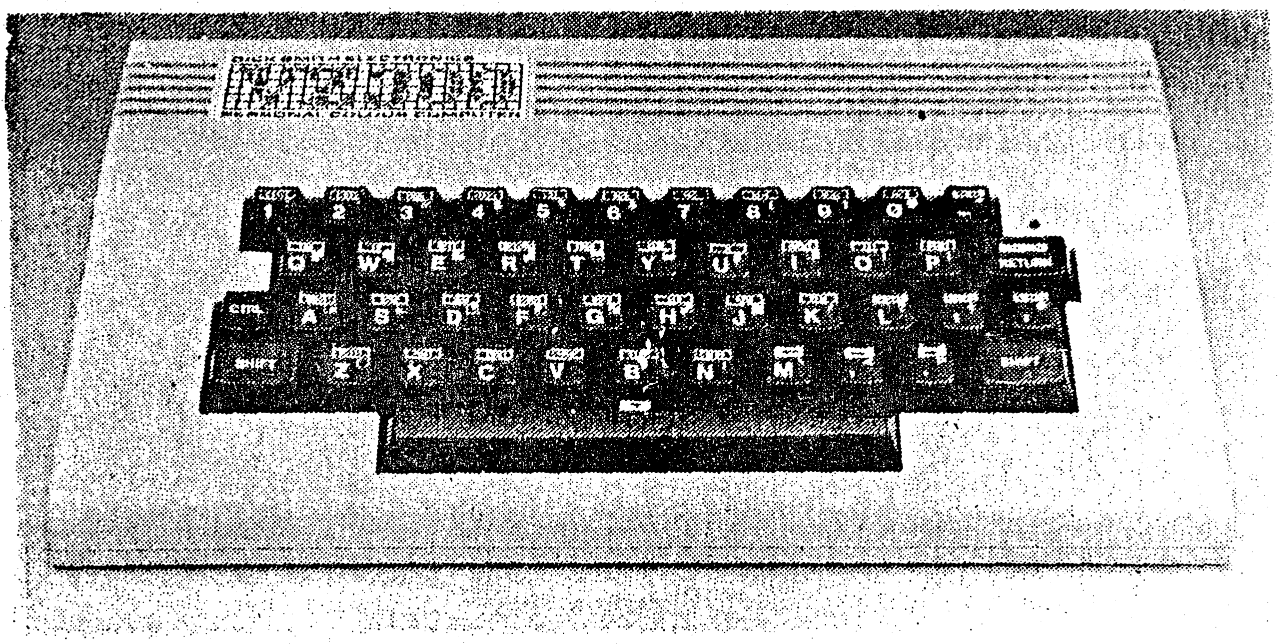
ISSUE NUMBER 3.

HUNTER VALLEY VZ USERS' GROUP NEWSLETTER.



AUGUST 1986.

PRESIDENT..........Peter Ellis

VICE PRESIDENT.....Mark O'Brien

SECRETARY..........Ross Woods

TREASURER..........Leigh Rogers

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*** P.S. GAVINs' telephone number has changed.

(049) 621678

Hello, it's that time again. Gee, time flies when you're having fun. How we ever find time and enough material to put this Newsletter together in a Month I'll never know. It seems like we no sooner finish the last one and it's time to start the next one. You will excuse me if I rave on a bit won't you, it's the only way I can fill the page. The position of Treasurer has been filled by Leigh Rogers (no relation to Roy) and She has my everlasting gratitude. Have fun Leigh.

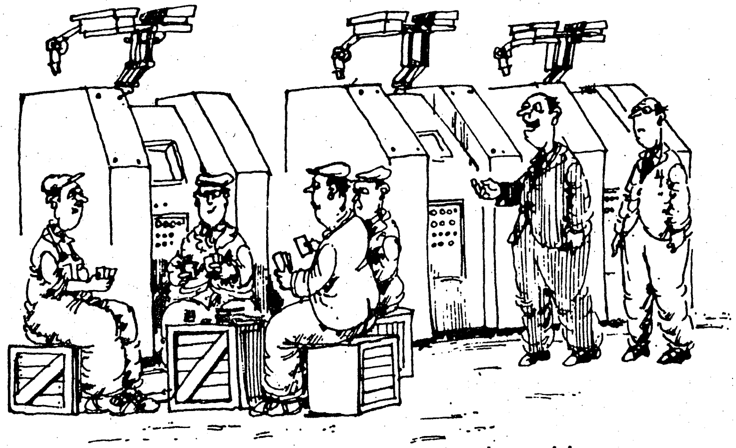
A big welcome home to Le' Patron, Father Ray Nelson who informs me that nobody tried to Skyjack His plane (they would'nt dare). Nice to see you came back in time for our party Father Ray. (Good to see you getting your priorities in order). Speaking of the party, I dont know about the rest of you but I quite enjoyed it. That will be the last one for a while because we dont want to spoil you, besides we can't afford it. I would like to thank Doris and Darren for coming along and representing Dick Smith Electronics. I hope you enjoyed yourselves and were not asked too many silly questions. Do feel free to drop in any time as you are always welcome.

Also thanks to Jamie Perry from the D.S.E computer support group for sending us some interesting programs. Some of these programs will be listed in the Newsletter for you to copy. How about some more contributions from you members out there. We are only getting articles from a select few at the moment and while they are doing a Magnificent job, we would like to see more effort from other members. Don't forget, if you find it interesting we might too. Just contact any committee member for infomation.

Are there any budding Artists or Cartoonists out there? I want to start a Cartoon strip but being lousy at drawing I need HELP!!!

Okay,thats all from me 'til next month. Happy reading and make those VZ's earn their keep.

Pete.



'With this new computerised machinery we can have more of our men playing cards than ever before.

What a monster size Issue. It's about 1.30pm on the Thursday afternoon, this has to be printed and stapled yet! Thanks Leigh!

A bigger than ever BEGINNERS SECTION, this month. This is, in main, due to requests from Members. It's good to get feedback from Members and interested parties. A special thanks to Ron Fishburn, a Subscriber from the N.S.W. Central Coast, for your letter. Rons' letter had some interesting ideas, some of which we hope to implement in the near future.

I have been in contact with Jamie Perry, of the D.S.E Computer Support Group in Sydney, again. Thanks to Jamie for your helpful advice and for your programs, also.

On the subject of Thank You, I must declare my gratitude to those people who make this publication possible. That's the people who contribute articles. From as far a field as Adelaide, thanks DAVE, for you PBUFF write up this month, I'm sure Don would be more than happy with it. We are looking foward to the follow up article(s) on this. Look out for these in the next Issue. A little closer to home is Robert from Wagga Wagga. Thanks Robert for your constructive criticism, and for your seemingly tireless effort of writing articles. I still have the one we missed out on last month, mate. The current article of Roberts' will be continuing for at least another two Issues. Much closer to home now is Matthew, from Ratmines. Matthews' review is with us once again this month, but as well as that, Matthew has compiled a hi-res PEEK and POKE chart. An absolute nessecity to the beginner or advanced programmer. Thanks Matthew.

More good news is that we have a new Treasurer. Leigh has answered the positions vacant ad. in our last Issue and has agreed to accept the challenge.

I guess the bad part had to come sooner or later, I'm a bit dissapointed with the lack of people using the SWAP & SHOP section. Remember, your only cost is effort. On bad news, there are still a couple of people who haven't paid their membership. If your having problems, see either Pete or myself on the quiet, before we see you loudly next meeting! Only one further thing the has come to my attention, please LEAVE other peoples' hardware, etc. alone until you ask! It's really only common courtesy.

There is a revised copy of the constitution available tonight, please make sure you pick up a copy. Subscribers should have one mailed to them shortly. Just quickly, on that, if you hear about us, but live to far away to attend meetings but would like to recieve our Newsletter, just drop us a line or call myself or Pete or Ross.

Gavin (049) 621678
Pete (049) 695697
Ross (049) 712843

```
100 POKE30744,1:CLS:PRINT"  METEOR BY JAMIE PERRY 1984":PRINT
110 PRINT"  .   =  20 FUEL CELLS"
120 PRINT"  +   =  50 FUEL CELLS"
130 PRINT"  *   =  INSTANT DEATH"
140 PRINT"  V   =  YOU":PRINT
150 PRINT"  M   =  MOVE LEFT"
160 PRINT"  ,   =  MOVE RIGHT"
170 PRINT"  S   =  START":PRINT:PRINT"  HINT/ WATCH YOUR FUEL"
180 FORC=1TO5000:IFINKEY$="S"THEN190ELSENEXT
190 CLS
200 A=28850:S=100:T=1:A$=""
210 PRINT@480+RND(26),"* .";A$
220 IFT/100=INT(T/100)THENA$=A$+" *":PRINT@99,"METEORS":SOUND1,2
230 J=PEEK(A):IFJ=42THEN400
240 IFJ=46THENSOUND30,1:S=S+20:POKEA+1,41:POKEA-1,40
250 IFJ=43THENCOLOR,1:SOUND29,1;25,1:S=S+50:COLOR,0
260 POKEA,22
270 IFRND(99)>90THENPRINTTAB(RND(29));"+";
280 S=S-2:PRINT@0,"FUEL";S:T=T+1
290 IFS=0THENPRINT@200,"NO FUEL":GOTO400
300 POKEA,32
310 IFC<5001THEN320ELSE350
320 IFINKEY$="M"THENA=A-1:POKE26666,1:POKE26666,0
330 IFINKEY$=","THENA=A+1:POKE26666,1:POKE26666,0
340 GOTO210
350 IFPEEK(A+63)=46ORPEEK(A+63)=43ORPEEK(A+94)=46THENA=A-1
360 IFPEEK(A+65)=46ORPEEK(A+65)=43ORPEEK(A+98)=46THENA=A+1
370 IFT<HANDPEEK(A+32)=42THENA=A+1
380 IFINKEY$="S"THENC=0:GOTO190
390 GOTO210
400 POKEA,24
410 POKE30744,0
420 PRINT@300,"YOUR SCORE";T
430 IFT>HTHENH=T
440 PRINT@364,"HIGH SCORE";H:IFH=TTHENPRINT@352,"YOU GOT THE "
450 IFH=TTHENSOUND25,4;22,3;29,2;31,1;29,2;27,3;24,2;29,3
460 IFH=TTHENSOUND0,9;0,9:GOTO500
470 PRINT@396,"BY ";N$;"  "
480 SOUND16,5;0,1;16,5;0,1;16,2;16,1;19,5
490 SOUND18,4;18,3;16,4;16,3;15,4;16,4
500 POKE30744,1:IFC=5001THENN$="V-ZED":GOTO520
510 IFH=TTHENCLS:INPUT"NAME PLEASE";N$:GOTO100
520 FORA=1TO1000
530 IFINKEY$="S"THEN190
540 NEXT:GOTO100
```

The above is a LLISTing of a game provided by Jamie Perry. Jamie is part of the D.S.E. Computer Support Group, in Sydney. He recently sent us up a disk with a multitude of programs on it. Including a machine code Epsom Printer Patch! All these programs are public domain.

The above program, METEOR, works fine in its current form. The challenge is for you to see what you can do with it from here. It's only a very short LLISTing, considering what it does, so far. Perhaps you could put a little more color into the game, or even some "real space ship" sound effects. Let us know what you come up with and we will send the best result back to Jamie for his comments.

TRY POLISHING YOUR CAR WITH THIS BUFFER . . .

Okay Boys and Girls, hands up if your VZ is "tied-up" while your printer trundles along. Even 120cps is slow when waiting for your printer to finish so you can get back to your computer. Waiting for your plotter at 12 cps, is almost unbearable. Of course a plotter can be forgiven considering that printing text at 12 cps is its secondary purpose, while drawing graphics etc., in color to boot, is its main use.

Some computers, such as the D.S.E. Multitech, allows part of their inbuilt RAM to be used as a SPOOLER, but this slows down the machine a bit, but you would hardly notice, due to the way that the SPOOLER is serviced by the CPU.

Other machines (VZ, C-64, TI-99, SEGA etc.) that don't have the RAM to spare or even the ROM routines to do the job, have to have an alternative way around the long wait while the printer trundles away.

THE ANSWER

Buy or build a "STAND ALONE" PRINTER BUFFER. A bought Buffer can cost many hundreds of dollars, but a "Build Your Own" can be a lot less of an expensive proposition, depends what you have in the Black Box. There have been a few (3-4) buffers described in magazines and these have only appeared in English Mag's at that, as far as I know.

There is now available for the very reasonable price of $39, a "short form PBUFF kit" from MR Don McKenzie (address below), to which you add the extra parts. Don supplies the P.C. Board, Operating System in ROM and full documentation which is excellent. There are 64K RAM and 256K RAM versions available, you must state which when odering from Don.

The extra parts are standard and are readily available.

I have built one of Dons' 64K Buffers and found it easy to construct as the P.C. Board is single sided and the instructions are "STEP BY STEP" to installing the chips and fault finding (heaven forbid). Make sure you use sockets for all the chips.

The difference between the 64K and 256K Buffers.

In the 256K RAM version, all 8 RAM chips (#41256) MUST be installed for correct operation.

With the 64K RAM version (#4164/#4864), RAM may be installed in BLOCKS/STEPS such as :-

1 RAM chip - 8K
2 RAM chips - 16K
4 RAM chips - 32K
8 RAM chips - 64K

Only the above configurations are allowable, 3, 5, 6 and 7 chips are illegal, and may interfere with the correct operation of the Buffer.

Also available from Don as ADDITIONS to the Buffer are :-
1/ I/O Board - recommended when purchasing the Buffer (PBUFF).
2/ Serial Board.
3/ Printer Switch - 1 Computer to 2 Printers.
4/ Computer Switch - 2 Computers to 1 Printer.

The PBUFF is standard "Parallel to Parallel". The addition of the Serial Board will suit anyone with a Serial Port.
Options with the Serial Board :-
1/ Parallel to Serial.
2/ Serial to Parallel.
3/ Serial to Serial.
4/ Parallel to Parallel.

All the P.C. Boards are Single Sided and are designed to plug into each other, in a STACK FORMATION. This allows extra Printer Switches, Computer Switches and Serial Boards, to be added on.

A typical example of the using of some of these options might be :-
Computer, PBUFF, Printer Switch and 2 Printers (Dot Matrix and Plotter). The Printer Switch save from having to power down while you change from one printer to the other, or any thing else you may like to attach.
Dons' PBUFFs have other features as well - RESET, TEST, COPY, HEX output as well as HARDWARE and SOFTWARE PAUSES.

WHERE AND WHEN TO USE YOUR PBUFF.

The PBUFF fits between the Printer Port (VZ INTERFACE) and the Printer(s). Depending on what you send to the printer, the PBUFF will appear like a printer, but somewhere between "Transparent" and "Normal" for printing time.

Ex.1. The PBUFF will appear transparent if you send very simple commands to the printer.
E.G. - LPRINT:LPRINT:LPRINT:LPRINT
- FOR X=1 TO 10:LPRINT X:NEXT
- OR very short LLISTings

Ex.2. You LLIST a program to the printer for debugging purposes. While this would normally take some minutes for the printer to trundle along, the VZ is "TIED UP" for the whole time and can't be used (even longer for a plotter and larger LLISTings). With a PBUFF "IN LINE", the VZ is "FREED" in a matter of SECONDS and the PBUFF feeds the printer. While this is happening, you can be using the VZ for other things.

Ex.3. Most programs will RUN from the PBUFF as well (like LLISTing), but I've found with some programs (screen dumps to plotters) that the VZ can still be "TIED UP" for almost the Normal printing time. This doesn't happen very often though and the time taken depends entirely on the program.

The VZ sees the PBUFF as a super fast printer but will still "HANG UP" if the PBUFF is not turned on. While printing, the PBUFF will accept more DATA to print until it fills up, in which case, naturally, the VZ will "TIE UP". With only a 64K PBUFF this will take some time.

Once in use, you will wonder how you ever got on without a buffer before. This article is nearly 7000 bytes long and the PBUFF accepts it in UNDER 4 SECONDS !!!

THE COST

A 64K PBUFF, metal case and power supply will set you back about $190, this is approx. only and will depend on prices at the time of purchase. You would have to add about another $30 to this for the 256K unit. I used a case from ALTRONICS, cat #H 0444. D.S.E. cat # H-2744. I also used Machine Sockets for the "PLUG and STACK FORMATION" and for the large chips on the buffer board. Adding a printer switch will cost another $54, (approx.).

* *

NEXT MONTHS PROJECTS
The printer switch and computer switch.

THE PRINTER SWITCH.
This unit enables you to drive 2 printers or anything that looks like a printer from the output of the PBUFF, (possibly speech syn., compumuse, etc.). These units may be stacked so that Multiple Printers etc. can be driven at the flick of a switch. Approx. cost - $54.

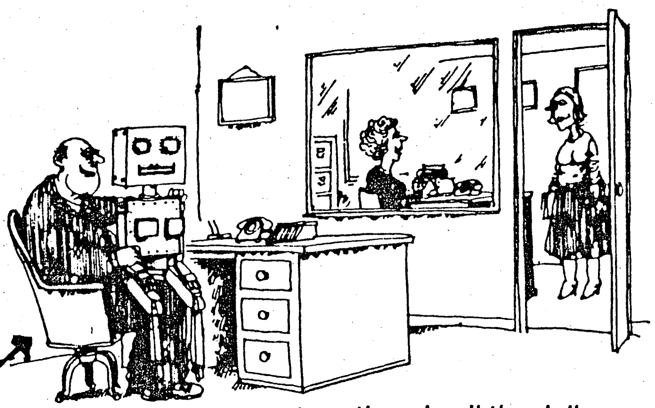
THE COMPUTER SWITCH.
This unit is in effect the opposite to the printer switch. This allows you to feed 2 computers into one PBUFF then on to one printer etc. These units can also be stacked. The computers need not be the same type. Approx. cost is also $54.

For those of you who are wondering what happened to the Serial Board (cost $?). Well, I haven't made either a Serial Board or a Computer Board, up as yet so I can't really comment on them, BUT, coming from Don, they would be of the same Excellent Quality.

This article was contributed by :-
Mr. Dave Boyce,
41 Heather Drive,
Christie Downs 5164
SOUTH AUSTRALIA.

For ordering, questions etc., contact :-

Mr. Don McKenzie,
29 Ellesmere cres.,
Tullamarine. 3043.
VICTORIA. AUSTRALIA.



'I'm all for computers, they do all the dull, boring jobs for you.'

Self portrait of Dave Boyce ?

VZ Asteriods from DSE is one of their best available VZ games. For $14.95 you get a quite addictive high resolution shoot em to bits action packed game promising hours of fun.

It is based on the origin of a game which I think was actually called asteriods, but I'm not quite sure because of the various versions floating around. The idea of the game is to destroy all the asteriods that are floating about you. The only trouble is, when you shoot them, they break up into smaller pieces that are just as deadly as the larger ones and the is also. the occassional UFO that flies in and shoots back at you.

You are given a 360 degree turning lazer gun equipped with hyperspace and thrust. The thrust direction is determined by the way the lazer points and the longer you thrust the faster you'll go. It is advised that hyperspace be used with extreme caution as it propells you to a random position in space and you may wind up directly in the path of a asteriod. A stage is completed when all asteriods are destoyed. A new screen full a more and much faster moving asteriods will then be displayed.

This game, like most other good ones, is written by Dubios and Mc Namara who seem to be somewhat experts in this field. The program is written in machine language called from basic and starts off, once run, with the usual JOYSTICKS Y OR N statement.

THE SCORING IS AS FOLLOWS:

LARGE ROCKS	- 100 points
MEDIUM ROCKS	- 50 points
SMALL ROCKS	- 20 points
UFO s	- 1000 points

An extra man is also awarded for every 10000 points.

This is one time when I would suggest that the joysticks would not be easier than the keyboard to use. As shown below, pulling the joystick down is hyperspace and it is not hard, as I soon found out, to be changing your direction of rotation and accidently pull the joystick down slightly whilst moving across from side to side. This results in a hyperspace and as previously mentioned, this may, if the screen were crowded, cause certain death.

*** CONTROLS ***

FUNCTION	KEYBOARD	JOYSTICK
turn left	U	LEFT
turn right	I	RIGHT
thrust	O	UP
hyperspace	P	DOWN
fire	Z or SPACE	FIRE

LOADING TIME: Disk- sec.
Tape- min.

GRAPHICS.....*****
SOUND........**
ANIMATION....*****
OVER ALL.....*****

Excellent use is made of the high res. graphics, the title page being a most impressive feature. It also allows for a 2 player game on either joysticks or keyboard. The only criticism I have is about sound effects which seem to be nearly non-existant. The only sounds to be heard are when you fire, when you hit a rock with a shot and when a UFO fires. There should in distinguishing your shots from the UFO's, as yours are blue and his are yellow. You should be used to avoiding yellow after a few screens.

VZ-200/300 MODE(1) PEEK & POKE CHARACTER CODE

Compiled by Matthew Taylor

Well here is a Godsend for those of you who have tackled POKEing in lo-res, it's a hi-res PEEK and POKE chart. Your VZ has, when POKEing in hi-res, 32 locations going across the screen and 64 going down. Each one of the 32 horizontal locations are made up of the four colors available in hi-res. You may POKE any value between 0 and 255 inclusive, (giving you 256 options), to give any combination of these colors. In other words, the POKE value specified after a screen location represents a combination of a four part pixel.

Hi-res starts at 28672 (dec) and ends at 30719 (dec).

For example, to place a yellow + blue + yellow + blue (ybyb) pixel in the top left hand cornrer of the screen, select mode(1) and POKE 28672,102

Another example is a program in our 'graphic routine' section. It's called VZ, type it in.

GGGG	0.	GYYY	21.	GBBB	42.	GRRR	63.	YYYG	84.
GGGY	1.	GYYB	22.	GBBR	43.	YGGG	64.	YYYY	85.
GGGB	2.	GYYR	23.	GBRG	44.	YGGY	65.	YYYB	86.
GGGR	3.	GYBG	24.	GBRY	45.	YGGB	66.	YYYR	87.
GGYG	4.	GYBY	25.	GBRB	46.	YGGR	67.	YYBG	88.
GGYY	5.	GYBB	26.	GBRR	47.	YGYG	68.	YYBY	89.
GGYB	6.	GYBR	27.	GRGG	48.	YGYY	69.	YYBB	90.
GGYR	7.	GYRG	28.	GRGY	49.	YGYB	70.	YYBR	91.
GGBG	8.	GYRY	29.	GRGB	50.	YGYR	71.	YYRG	92.
GGBY	9.	GYRB	30.	GRGR	51.	YGBG	72.	YYRY	93.
GGBB	10.	GYRR	31.	GRYG	52.	YGBY	73.	YYRB	94.
GGBR	11.	GBGG	32.	GRYY	53.	YGBB	74.	YYRR	95.
GGRG	12.	GBGY	33.	GRYB	54.	YGBR	75.	YBGG	96.
GGRY	13.	GBGB	34.	GRYR	55.	YGRG	76.	YBGY	97.
GGRB	14.	GBGR	35.	GRBG	56.	YGRY	77.	YBGB	98.
GGRR	15.	GBYG	36.	GRBY	57.	YGRB	78.	YBGR	99.
GYGG	16.	GBYY	37.	GRBB	58:	YGRR	79.	YBYG	100.
GYGY	17.	GBYB	38.	GRBR	59.	YYGG	80.	YBYY	101.
GYGB	18.	GBYR	39.	GRRG	60.	YYGY	81.	YBYB	102.
GYGR	19.	GBBG	40.	GRRY	61.	YYGB	82.	YBYR	103.
GYYG	20.	GBBY	41.	GRRB	62.	YYGR	83.	YBBG	104.

YBBY 105
YBBB 106
YBBR 107
YBRG 108
YBRY 109
YBRB 110
YBRR 111
YRGG 112
YRGY 113
YRGB 114
YRGR 115
YRYG 116
YRYY 117
YRYB 118
YRYR 119
YRBG 120
YRBY 121
YRBB 122
YRBR 123
YRRG 124
YRRY 125
YRRB 126.
YRRR 127.
BGGG 128.
BGGY 129.
BGGB 130.
BGGR 131.
BGYG 132.
BGYY 133.
BGYB 134.
BGYR 135.
BGBG 136.

BGBY 137.
BGBB 138.
BGBR 139.
BGRG 140.
BGRY 141.
BGRB 142.
BGRR 143.
BYGG 144.
BYGY 145.
BYGB 146.
BYGR 147.
BYYG 148.
BYYY 149.
BYYB 150.
BYYR 151.
BYBG 152.
BYBY 153.
BYBB 154.
BYBR 155.
BYRG 156.
BYRY 157.
BYRB 158.
BYRR 159.
BBGG 160.
BBGY 161.
BBGB 162.
BBGR 163.
BBYG 164.
BBYY 165.
BBYB 166.
BBYR 167.
BBBG 168.

BBBY 169.
BBBB 170.
BBBR 171.
BBRG 172.
BBRY 173.
BBRB 174.
BBRR 175.
BRGG 176.
BRGY 177.
BRGB 178.
BRGR 179.
BRYG 180.
BRYY 181.
BRYB 182.
BRYR 183.
BRBG 184.
BRBY 185.
BRBB 186.
BRBR 187.
BRRG 188.
BRRY 189.
BRRB 190.
BRRR 191.
RGGG 192.
RGGY 193.
RGGB 194.
RGGR 195.
RGYG 196.
RGYY 197.
RGYB 198.
RGYR 199.
RGBG 200.

RGBY 201.
RGBB 202.
RGBR 203.
RGRG 204.
RGRY 205.
RGRB 206.
RGRR 207.
RYGG 208.
RYGY 209.
RYGB 210.
RYGR 211.
RYYG 212.
RYYY 213.
RYYB 214.
RYYR 215.
RYBG 216.
RYBY 217.
RYBB 218.
RYBR 219.
RYRG 220.
RYRY 221.
RYRB 222.
RYRR 223.
RBGG 224.
RBGY 225.
RBGB 226.
RBGR 227.
RBYG 228.
RBYY 229.
RBYB 230.
RBYR 231.
RBBG 232.

RBBY 233.
RBBB 234.
RBBR 235.
RBRG 236.
RBRY 237.
RBRB 238.
RBRR 239.
RRGG 240.
RRGY 241.
RRGB 242.
RRGR 243.
RRYG 244.
RRYY 245.
RRYB 246.
RRYR 247.
RRBG 248.
RRBY 249.
RRBB 250.
RRBR 251.
RRRG 252.
RRRY 253.
RRRB 254.
RRRR 255.

TECHNICAL REPORT.

The circuit diagram shows a "STAND ALONE" 18K memory expansion for the VZ 300. Optional is provision for placing RAM / ROM / EPROM in the cartridge area. There are three address decoders (#74LS138) shown on the left side of the circuit diagram. The top left decodes in 2K blocks, using #6116 RAMs and starts where internal ROM(s) leave off. It is possible, using this deoder to put 5 X 2K RAMs / EPROMs in the cartridge area.

The middle decoder also decodes in 2K blocks and only the last output is used which goes to the $\overline{CS}$ (chip select) input of the 2K(#6116) RAM.

The last decoder decodes in 8K blocks and only the last 2 outputs are used. The 24K (pin 13) output can be used to put an 8K RAM / EPROM in the cartridge area. Together with a 2K RAM / EPROM they would fill the 10K cartridge area.

Disk drive users can only use the 2K RAM / EPROM using the top address decoder in the area indicated.

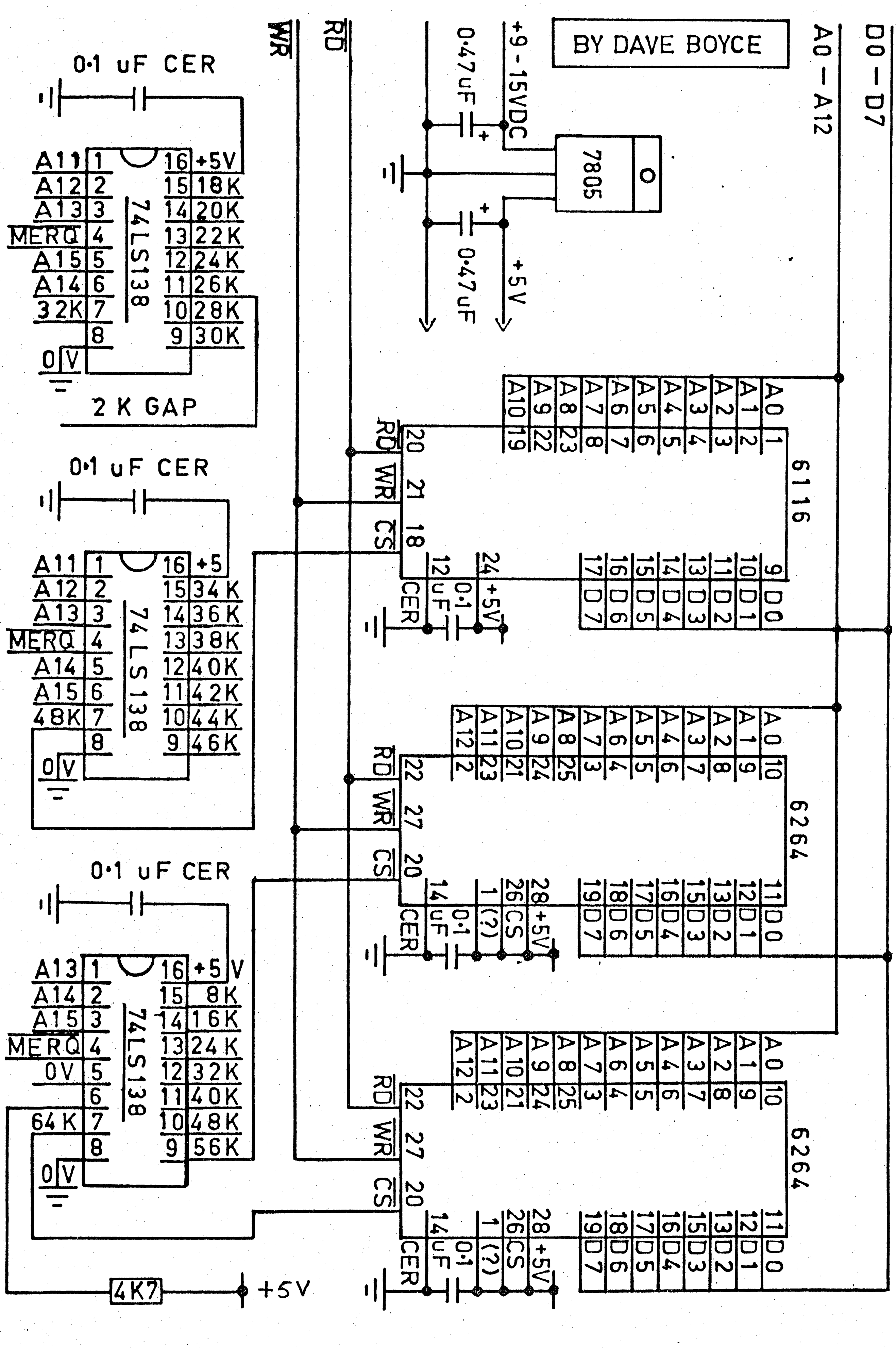
The bottom address decoder can also be used to place 2 X 8K BATTERY BACKED RAMS in the range of zero to 16K. One of the uses of the B.B.RAM in the ROM area would give the clever programmers out there the opportunity to reactivate the hidden BASIC / DISK COMMANDS / FUNCTIONS for later transfer to EPROM, etc.

If using the ETI 687 P.C.B. as used for VZ 200 memory expansion, care must be taken as it was not intended for VZ 300 use. The address decoding used for the 4 X 8K (#6264) memory chips, is different and can't be used to duplicate the ROMs or put 8K in the cartridge area for non disk users. The decoder IC inputs / outputs must be modified to match the bottom one in this Magazine. Also the middle and / or top decoder, (if required) must somehow be mounted on the P.C.B., or another board and point to point wiring used. I leave it to the ingenuity of the constructor as this article is intended as a design idea. The expansion could be powered from the VZ, but if the voltage regulator runs hot, use the extra one shown on the circuit diagram.

As mentioned in last months technical report the P.C.B. makes it a lot easier to achieve the above. Another method of construction is to use "RAM STACKING". Just place one IC on top of another and solder sockets in between, just like I have done in my VZ 200 PLUS. Put the lot in a box, mount a suitable edge connector and you should have an extra 18K of RAM plus any other options you have decided to incorporate. My thanks to D. Boyce, again for supplying the circuit diagrams for the VZ 300 expansion and the continuing technical information coming from him. Thanks Dave. I apologise for not going into more detail, but currently other commitments don't leave much time for computing.

JOE LEON
Technical Advisor.

VZ 300 18K MEMORY EXPANSION



UNDERSTANDING YOUR VZ . . . PART ONE.

First things first. Sincere thanks to Mr. Robert Quinn, of Wagga Wagga for providing us with the following article. I'm of understanding that this article was also offered to a leading computer publication. Can't understand why they didn't welcome it with open arms. Oh well! Their loss is certainly our gain. Thanks again Robert, especially for taking time out before your annual pilgrimage (?).

The following is the first of what, at this stage, will be a three part article. Program LLISTings will be published as the are relevant to the current section of the article.

ADDRESS POINTERS A/B	VZ MEMORY MAP	START ADDRESS	# of BYTES
		TOP OF MEMORY 36863 or 53247 (VZ200) 47103 or 63487 (VZ300)	
30897/8	DISK BUFFER		
30880/1	STRING SPACE		
	BASIC STACK		
30973/4	FREE MEMORY		
30971/2	ARRAY VARIABLES LIST TABLE		
30969/70	SIMPLE VARIABLES LIST TABLE		
30884/5	PROGRAM MEMORY	31465	
	COMMUNICATIONS REGION	30720	745
	VIDEO DISPLAY	28672	2K
	KEYBOARD, CASSETTE SPEAKER, VIDEO CONTROLLER	26624	2K
	ROM CARTRIDGES (DISK CONTROLLER)	16384	10K
	ROM, BASIC INTERPRETER OPERATING SYSTEM	0	16K

ADDRESS = PEEK(A) + PEEK(B) X 256

UNDERSTANDING YOUR VZ . . . PART ONE.

Some addresses in the COMMUNICATION REGION and their use.

30752,30753	pointer to address in video memory of cursor position (range: 28672 to 29183)
30862,30863	pointer to execute address for USR program
30880,30881	pointer to lowest address of string space
30884,30885	pointer to start address of basic program
30887,30888	pointer to start keyboard buffer
30897,30898	pointer to end of user memory
30934,30935	pointer to next available place in string space
30969,30970	pointer to start of variable list table (end of basic program)
30971,30972	pointer to start of array variable table
30973,30974	pointer to end of array variable table
30975,30976	pointer to current address in DATA statement
30882,30883	current line number as basic program runs
30938,30939	line number of last DATA statement READ
30955,30956	line number for last basic line entered/deleted
31009,31010	USR ARGUMENT store
31208	start of INPUT buffer (basic lines and commands)
30776	enable/disable INVERSE printing: POKE 30776,2 enables
30779	copy of output latch/key beep: 0 disables; 1 enables
30876	output device code
31003	TRACE ON/OFF: POKE 31003,1 for on/ 0 for off
30886	cursor (TAB) position
30845,30846,30847	interrupt exit
30977 to 31002	variable declaration table
30720 to 30731	four machine code JUMP instructions to various addresses in ROM

UNDERSTANDING YOUR VZ . . . PART ONE.

Here is a collation of understandings to help you exploit the hidden facilities, and realise more fully the powers, of your VZ. Let's begin with a briefing on some fundamentals as we work our way up the VZ's memory map.

At the bottom of memory is READ ONLY MEMORY -- ROM -- where, permanently etched byte by byte into their memory cells, reside the intricate sets of machine code instructions and data that make up the VZ's operating system. Without them, your VZ doesn't know what to do. Whilst with them, it is your obedient servant.

Each memory cell is identified by a unique address, a number you can use to PEEK at the content of that cell. Though, if the address of a memory cell is greater than 32767, you must use a negative address for PEEKs and POKEs. This negative address is the ordinary address less 65536.

Eg. PRINT PEEK(42326-65536).

A cell is filled with a "number", the BYTE, which can be any number in the range 0 to 255. You can PEEK (take a look) at ROM cells, but you can't POKE/change their contents. VZ ROM occupies address from 0 to 16383. The next 10240 (10K:1K = 1024 bytes), memory cells may or may not exist for your VZ; these addresses are reserved for "PLUG IN" memory cartridges. If you have a disk drive, this is where the ROM memory in your disk controller takes up residence in your VZ.

Where ROM ends, RAM begins! And it is RAM memory that will be our main concern from here on. You can both PEEK at (what's there?) and POKE to (take that!) RAM memory cells, with the certainty that the POKEs will change the contents of the cells. RAM memory begins at address 26624 and ends - who knows? It all depends on your system. The built in memory of a VZ 200 (VZ 300) will end at 36863 (47103). A VZ 200 (VZ 300) with 16K memory expansion module installed will end at 53247 (63487). You can find the END OF MEMORY address with the following command :-

PRINT PEEK(30897) + PEEK(30989) * 256

With a disk drive installed, the disk controller reserves 311 memory cells at the top of memory for its own use, and the end of memory command will PRINT an address that is 311 bytes less than the actual end of memory address. The disk controller doesn't want you poaching on its territory.

Video memory from 28672 to 30719 holds the screen display. Above video RAM lies a stretch of 745 memory cells (30720 to 31464) called the COMMUNICATIONS REGION which is used by the computer to keep track of many things. Numerous POINTERS are located in this region, pairs of memory cells that store addresses, such as the end of memory address. A list is provided with this article of many of the locations in the communications region and what they are used for.

PART 2 NEXT MONTH...

Welcome for the second time to Beginners Section. This month we have some interesting POKEs and some clever "print" based subroutines. We don't admit to knowing why the VZ behaves as it does with these particular POKEs, but they are interesting anyway.

This one rather speeds things up a bit (or byte), try using it in a lo-res screen display program...

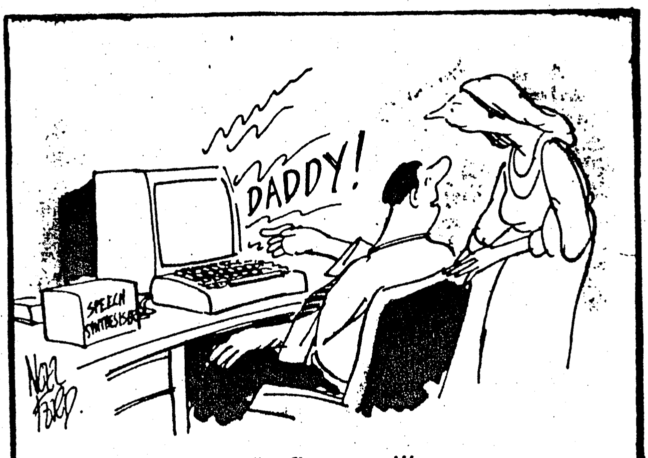
```
10 POKE 30777,0
20 GOTO 10
```

Don't want anyone to play with your game while your getting a coffee ...? type this in ... it will DISable all keys except CTRL & BREAK ...

```
10 POKE 30875
20 GOTO 10
```

Okay, they're the POKES. Now lets try some PRINT subroutines that you can use in your programs to liven them up a bit. I won't give you the lot now because we will save some for next time. By the way if you have any small routines like the following that you would like to share with other Members, then please pass them on to your Editor.

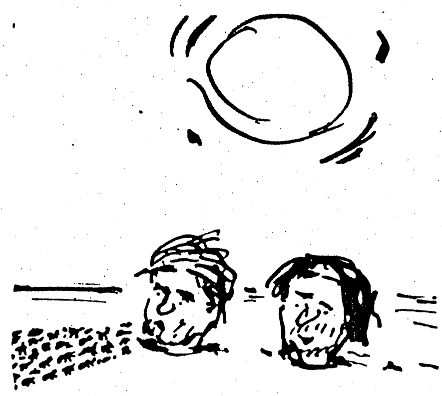
```
100 CLS
110 ' FIRST PART PRINTS ONE LETTER AT A TIME, FROM LEFT TO RIGHT
120 CLEAR 1000
130 A$="SURE PRINTS SLOW, DOESN'T IT"
140  B$="SURE PRINTS SLOW, DOESN'T IT"
150 FOR N=1 TO LEN(A$)
160  PRINT@98,LEFT$(A$,N);
170   FOR I=1 TO 75
180   NEXT I
190 NEXT N
200 REM THIS SECTION SCROLLS INVERSE FROM LEFT TO RIGHT
210 FOR N=1 TO LEN(B$)
220  PRINT@98,RIGHT$(B$,N)
230   FOR I=1 TO 15
240   NEXT I
250 NEXT N
260 REM THIS SECTION SCROLLS OFF THE SCREEN
270 FOR X=1 TO 200
280 NEXT X
290 P=126
300 J=J+1
310 E$=MID$(B$,J,28)
320 PRINT@98,E$
330 P=P-1
340 PRINT@P," "
350 IFJ<28THEN300
```



'Its first word!'

```
100 ' COLORS FROM TOP TO BOTTOM, LEFT TO RIGHT, USING ALL COLORS
110 CLS
120 C=143
130 POKE 30744,1
140 A=28672
150 B=29152
155 IF C>255 THEN 510
160 FOR X=A TO B STEP 32
170  POKE X,C
180 NEXT X
190 A=A+1
200 B=B+1
210 IF A>28703 THEN 215 ELSE 160
215 C=C+16
220 A=28672
230 B=28703
240 FOR X=A TO B
250  POKE X,C
260 NEXT X
270 A=A+32
280 B=B+32
290 IF A>29152 THEN 300 ELSE 240
300 C=C+16
310 A=28703
320 B=29183
330 FOR X=B TO A STEP -32
340  POKE X,C
350 NEXT X
360 A=A-1
370 B=B-1
380 IF A < 28672 THEN 390 ELSE 330
390 C=C+16
400 A=29152
410 B=29183
420 FOR X=B TO A STEP -1
430  POKE X,C
440 NEXT X
450 A=A-32
460 B=B-32
470 IF A < 28672 THEN 480 ELSE 420
480 C=C+16
490 IF C > 255 THEN 120 ELSE 140
500 GOTO 120
510 POKE30774,0:FORX=0TO10000:NEXT
```

```
10 CLS:A$="FLASHER":B$="FLASHER"
20 PRINT@74,A$
30 FOR X=1 TO 100:NEXT
40 CLS
50 FOR X=1 TO 100:NEXT
60 PRINT@74,B$
70 FOR X=1 TO 100:NEXT
80 GOTO 10
```



'Hey, you know this would make a great micro game!'

```
100 CLS
110 REM LINES 20 TO 40 DRAW ALONG TOP OF SCREEN
120 FOR X=28672 TO 28703
130  POKE X,239
140 NEXT X
150 REM LINES 110 TO 130 DRAWS RIGHT HAND SIDE OF FRAME
160 FOR X=28704 TO 29120 STEP 32
170  POKE X+31,239
180 NEXT X
190 REM LINES 160 TO 180 DRAWS ALONG THE BOTTOM OF SCREEN
200 FOR X=29183 TO 29152 STEP -1
210  POKE X,239
220 NEXT X
230 REM LINE 210 TO 230 COMPLETES BORDER ON LEFT HAND SIDE
240 FOR X=29120 TO 28704 STEP -32
250  POKE X,239
260 NEXT X
```

VZ.

```
100 MODE(1)
110 FORX=28672TO28703:I=RND(255):POKEX,I:NEXT
120 FORX=28704TO30687STEP32:I=RND(255):POKEX+31,I:NEXT
130 FORX=30719TO30687STEP-1:I=RND(255):POKEX,I:NEXT
140 FORX=30687TO28672STEP-32:I=RND(255):POKEX+1,I:NEXT
150 X=28930
160 K=0
170 I=RND(255):POKEX+K,I:K=K+32
180 IFK>96THEN190ELSE170
190 X=X+K+1:IFX>30607THEN200ELSE160
200 X=30608
210 K=0
220 I=RND(255):POKEX+K,I:K=K+32
230 IFK>96THEN240ELSE220
240 X=X-K+1:IFX<28832THEN250ELSE210
250 X=28939:Y=28948
260 FORJ=XTOY:I=RND(255):POKEJ,I:NEXT
270 X=X+32:Y=Y+32:IFX<>29067THEN260
280 I=RND(255):POKEY,I:Y=Y+32:IFY<>29204THEN280
290 Y=29202
300 I=RND(255):POKEY,I:POKEY+1,I:Y=Y+32:IFY<29330THEN300
310 Y=29328
320 I=RND(255):POKEY,I:POKEY+1,I:Y=Y+32:IFY<29426THEN320
330 Y=29454
340 I=RND(255):POKEY,I:POKEY+1,I:Y=Y+32:IFY<29554THEN340
350 Y=29580
360 I=RND(255):POKEY,I:POKEY+1,I:Y=Y+32:IFY<29708THEN360
370 Y=29707
380 I=RND(255):POKEY,I:Y=Y+32:IFY<29835THEN380
390 X=29835:Y=29844
400 FORJ=XTOY:I=RND(255):POKEJ,I:NEXT
410 X=X+32:Y=Y+32:IFX<29963THEN400
420 GOTO150
```

Just a few minor quick hints for VZ DOS users.

1/. For drive head cleaning, if you intend on using the readily available "VERBATIM" cleaning disk, make sure you turn it UPSIDE DOWN, as this is the way your drive head is positioned. (in other words, REVERSE the instructions on cleaning disk).

2/. Also when cleaning, DO NOT place another disk in your drive immediately after removing cleaning disk. Wait at least 5 minutes for the alcohol based cleaner to dry thoroughly. Failure to do this may result in ruined disks as disk hub will slip and not turn, in the cleaner.

3/. If you own only one disk drive, REMEMBER to physically change your drive to DRIVE 2 PORT, when running disk control program from the new technical reference manual. Otherwise you may wonder why you just sat and typed this program in (it won't do a thing unless connected to port 2).

****

SWAP & SHOP.

WANTED TO BUY

2nd hand VZ Disk Drive and Controller

FOR SALE

Commodore C16 kit plus programs, etc.
Original value $500
Will SELL $200 o.n.o.

Contact JOE LEON on 512756.

****

I see it, but I don't believe it... It seems you just can't trust photocopiers these days. No, that's not at all true. I really did make, as hard as it is to accept, a (GULP) mistake. In the beginners section last month the DELETE routine should have read like this :-

```
0 D200-500
POKE 31469,182:RUN
now hit the RETURN key.
```

Thanks, Robert, for picking this up. I guess I'll have to just settle for immortality by itself, as it seems that I can't have infallability as well!